# THE GEOLOGY OF THE MT. REMUS AREA

## Introduction:

This report concerns a traverse made in February, 1963, from Hounslow Heath to the Fury River by way of the west-flowing creek immediately south of Mt. Remus. This creek is shown on recent maps as the "Devil's Ravine" but the name is probably misapplied and the name Nichol's Creek has been suggested.

The geological results of this traverse were unexpected, and are of considerable significance, so that the results of the traverse will be presented here in some detail.

## General Geology:

From west to east, as shown in the diagrammatic sketch, the succession is as follows:

Ordovician
- 10 Gordon Limestone
- 9 Moina Sandstone
- Unconformity

Cambrian
- 8 Bond Range Porphyry
- Unconformity or fault

Pre-Cambrian - Metamorphics of Mt. Remus
- 7 Quartzite
- 6 Schist, containing (5) dykes of the Mt. Remus dyke swarm.
- Fault

Pre-Cambrian - Non-metamorphics of Mt. Sumer
- 4 Sumer Group containing (5) dykes of the Mt. Remus dyke swarm.
- Fault, unconformity, or both.

Pre-Cambrian - Metamorphics of Hounslow Heath
- 3 Quartzite
- 2 Schist, overlain by (1) glacials

### 1. Glacials of Hounslow Heath

On the plateau known as Hounslow Heath, the schist is overlain by an extensive blanket of Pleistocene deposits, mainly periglacials. The topography near the Fury Mine and the head of Liol Creek suggests moraines, but identifiable exotic erratics are confined to a dolerite train along the eastern edge of the plateau, probably representing overflow from a tongue extending down the Dove Gorge. However dolerite trains on Sunshine Plain and in the Vale of Belvoir indicate that the ice crossed Hounslow Heath, there being overflow channels preserved near the Heap of Rocks. The headwaters of Pencil Pine Creek appear to arise from tails behind (north of) the quartzite crag which delimits the Heath on the south side. Observations in Cradle Valley on the south side of this ridge indicate that the ice at one time flowed up over this ridge, out of Cradle Valley, onto the Heath.

### 2, 3. Precambrian Metamorphics of Hounslow Heath

Most of Hounslow Heath, except for the quartzite ridge immediately north of Cradle Valley, is underlain by schist. The foliation dips flatly northwest, passing under a belt of quartzite which extends southwest from the Fury Mine, through the Heap of Rocks, to the un-named peak (see map). Although garnet and albite schists are known from the Dove River near Waldheim, only chlorite schists were observed near the Heap of Rocks.

The Precambrian structure is truncated on the west by a strong linear running north-east from Back

Peak to near the Fury Mine. This linear is a fault, unconformity, or both.

4. Precambrian Non-Metamorphics of Mt. Sumer

The Sumer Group is here defined as that belt of quartzites, mudstones, and grits, which outcrop on Mt. Sumer. They extend from 3874E, 8745N (near Back Peak) to 3845E, 8730N (about one mile east of Mt. Remus), across a width of nearly two miles. They also outcrop on the south edge of the Sunshine Plain at 3915E, 8815N, extending from there down the Iris River to within half-a-mile of the Cradle Mountain Highway, and up Black Bog Creek as far as 3945E, 8815N. It is likely that rocks of this group underly most of the headward basin of the Iris River, where it contains quartzite breccias and conglomerates and it probably constitutes most of the hills north of Back Peak.

Specimens of the Sumer Group are Nos. 179, 180.

The Sumer Group contrasts strongly with the Precambrian Metamorphics in that the rocks are un-metamorphosed there is no metamorphic foliation but only a weak fissility subparallel to bedding, the quartzite appears to have clastic texture, the beds appear to be graded, the lithological boundaries are of lithogenetic significance, and it contains interbedded coarse clastics. All these features are absent from the Metamorphics. The Sumer Group is correlated with the Rocky Cape Group of the North West Coast.

At 38722E 8744N 3600, the Group is represented by brown, chloritic quartzite, thinly to flaggily bedded, interbedded with micaceous mudstone. The absence of a strong metamorphic foliation is in marked contrast to the tectonites a little further east. At 3869E 8744N 3600 the quartzite is a medium to fine grained, with beds about twelve inches thick of coarse sandstone containing fragments of euhedral quartz. At 3958E 8733N 3700, there is a bed of conglomerate containing pebbles of quartzite and mudstone, one rounded quartzite boulder being three inches in diameter, in a matrix of green, chloritic mudstone. At 3848E 8732N 3250, the bedding is well exposed in a polished creek section. The beds of quartzite range from six to sixteen inches in thickness, averaging twelve inches, alternating with fissile, chloritic beds from two to four inches thick. The quartzite contains cubes of pyrite. None of the rocks are calcareous. It appears that the fissile beds are the fine-grained tops of graded beds, in which case the succession is right way up.

5. Dykes of the Mt. Remus Dyke Swarm

Dykes of the Mt. Remus Dyke Swarm intrude the Sumer Group, and those Metamorphics which lie to the west of it (but not, apparently, those metamorphics lying to the east of the Sumer Group). The dykes are mainly quartz porphyry. Over much of this country the dykes are positive weathering features, with the country rock masked by glacials, and at first sight the dykes appear to be part of a continuous belt. The weathering product of the dykes is in some places a quartz gravel, similar to that derived from the quartz grits of the Sumer Group. These two features are a source of difficulty in mapping poorly exposed terrain, as at the south edge of the Middlesex Plains. However exposures in this creek near Mt. Remus demonstrate the dyke form of many of the intrusions, and show that the major porphyry belt

(the Bond Range porphyry) lies some distance further west. It is possible that some stocks or sills are present, but none were observed.

It is proposed to name this collection of dykes the Mt. Remus dyke swarm, as the intrusive nature, and dyke form, are best seen in this creek south of Mt. Remus. Specimens of the Remus Dyke Swarm are Nos. 181, 182 (intruding Sumer Group) 186, 187 (intruding Metamorphics). Specimen No. 183 (a dyke intruding Sumer Group) is a biotite-felspar rock of granitic texture, which is different to the other dykes, and may be a Devonian intrusive

At 3860E 8741N 3760, there is a dyke or stock of medium grained quartz porphyry containing 20 per cent quartz phenocrysts averaging 2 mm diameter, and 40 per cent pyroxene averaging 3 mm diameter, in an indeterminate groundmass. At 38495E 8733N 3300, a dyke rock contains 40 per cent quartz averaging 0.5 mm, 20 percent felspar averaging 2 mm, 5 per cent pyroxene averaging 0.5 mm, in a white, indeterminate ground mass.

In the Sumer Group, as well as at the two localities mentioned above, there are a number of dykes. At 3848E, 8732N 3200 there is a small dyke, a few feet across. A few yards further west a waterfall falls over a pair of dykes containing angular to rounded, or sometimes slabs, of quartzite. The dykes appear to embay fault gouge. A little further west, near 3847E 87305N 3150 a small dyke is twelve feet wide. This is succeeded, to the west, by six feet of Sumer Quartzite, then by a grey granite dyke (biotite-felspar rock) about 50 feet wide. This dyke, at 3845E 8730N 3100, is different to the other dykes, and may be Devonian. After a few yards of Sumer Quartzite, the creek passes into Metamorphics, a blue mica schist, at 3844E 8730N 3090. Small porphyry dykes intrude the schists at 3837E 8728N 2990, and at 3835E 8727N 2950, the last-named dyke outcropping in both the main stream and the northern tributary, and lying just east of the pyritic lodes of the Remus prospect.

Except for the granite dyke, these dykes are a red quartz-felspar-porphyry, which is indistinguishable in hand specimen from the Bond Range Porphyry which forms a wide belt to the west of Mt. Remus. The dykes are regarded as feeders to the main porphyry belt.

6, 7. Precambrian Metamorphics of Mt. Remus

The western belt of Metamorphics consists of blue micaceous schist in the east, coarse green chlorite schists in the west. The foliation dips flatly west and north west, with undulations due to flexural refolds of low amplitude. The foliation dips under a quartzite which caps the Mt. Remus, and which caps the hill at 3822E 8707N. The quartzite dips west, flatter than the topography at creek level, so that much of it is cut off by the base of the porphyry, and little of it outcrops in the creek. Micaceous quartzites and quartz schists outcrop at creek level, representing this quartzite belt.

Specimens of these Metamorphics are Nos. 184, 185, 188.

The Mt. Remus Prospect

The Mount Remus Prospect consists of a group of pyritic lodes occupying fissures in schist, near 3835E 8728N 2950. The fissures form a group near the creek junction, trending generally east of north. Nye (1928)

recorded exploration by the Mt. Remus Prospecting Syndicate, on Reward Lease 10091/M, 80 acres, name of E.A. Nichols, on pyritic veins at several localities in this vicinity. Nye gave assay results as follows:

| Sample No: | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Mo | 1.57 | 0.2 | 1.33 | 0.65 | 45.67 |
| Va | 0.33 | 0.22 | 0.39 | 0.19 | 4.38 |
| Co | 0.33 | 0.30 | 0.31 | 0.18 | 0.63 |
| Cu | Nil | Nil | Nil | Nil | ---- |
| S | - | - | - | - | 38.24 |
| Fe | - | - | - | - | 8.20 |
| Total | - | - | - | - | 97.12 |

Samples 1, 2, 3, are from a six inch vein, 1 from the northeast end, 2 from the south west end, and 3 being friable pyrite from along its length. Sample 4 is from a stockwork in schist, two to three feet wide, wile 5 is molybdenite selected from a number of veins.

Nye recorded the graphitic appearance of the molybdenite, suspected the presence of tenorite (absent), but did not know whether the vanadium occurred in the pyrite or molybdenite, so forwarded samples to Stilwell for examination.

Stilwell (1932) assayed a bulk sample as follows:

| | |
|---|---|
| Mo | 0.48 |
| Va | 1.57 |
| Co | 0.50 |
| Cu | Nil |
| S | 49.70 |
| Fe | 39 |
| Insolubles | 8.9 |
| Pb | Nil |
| As | Trace |
| Ni | Trace |
| Zn | Trace |
| Total | 100.15 |

Stilwell recorded visible minerals as pyrite , molybdenite, haematite in chlorite, epidote, zoisite, mica, and quartz. He thought the cobalt occurred as linnaeite, and that the pyritic ore consisted of a mixture of pyrite and linnaeite. He said there were only traces of patronite ($VS_4$), and that the vanadium was probably contained in roscoelite (vanadium mica) now altered to chlorite.

The results of this work were not available on the recent visit, so the sampling will largely reproduce Nye's. Sample 24B is an approximate channel sample from the clean-walled, six inch wide, central portion of a vein a few feet west of the creek junction, which vein has an outer irregular portion up to eight inches wide.

Sample 24C is a chip sample across a cleanwalled vein eight inches wide. Sample 24D is molybdenite picked out of a number of veins.

1963

| | 24B | 24C | 24D |
|---|---|---|---|
| Au | Nil | Nil | Nil |
| Ag | Tr. | Tr. | Tr. |
| Mo | 0.43 | 0.49 | 0.48 |
| Co | 0.26 | 0.18 | 0.29 |
| V | Tr. | Tr. | Tr. |
| S | 47.1 | 46.5 | 36.8 |

8. The Bond Range Porphyry

This belt of massive, unstratified quartz porphyry extends from near 3820E 8721N 2110 (contact with Precambrian Metamorphics, not exposed in creek), to the floor of the valley of the Fury River at 3795E 8725N 850. The porphyry extends in a continuous belt to the north and the south. To the north, it occupies the eastern slope of the Bond Range, and is almost certainly equivalent to the Bull Creek porphyries of Mt. Stormont and the Lorinna area (Burns, 1961). To the south, it runs across Mt. Romulus, across White Hawk Creek, and down the eastern side of the Sophia Valley (W. Atkinson, M. Solomon, pers. comm.).

Specimens of this porphyry are Nos. 206,208,209, 211. Specimens 207,210, are vein material from within the belt. The rock is a hornblende-felspar-quartz porphyry, containing in places as much as 60 per cent quartz as phenocrysts. The rock is very red in outcrop, without banding, bedding, or any significant variation. It is massive and unsheared, in contrast to the rocks at Bull Creek which were strongly sheared in the Devonian, and are usually green in colour due to epidote which occurs as metamorphic segregations.

The porphyry is overlain directly by Ordovician conglomerate. There is no evidence of an intrusive contact, and further southwest W. Atkinson (pers. comm.) found porphyry as boulders in the basal conglomerate, so the boundary is an unconformity.

In view of Burns (1961) and the Remus dyke swarm, the Bond Range Porphyry appears to be a sill intruded at the base of the Dundas Group.

9, 10 Ordovician

The basal bed of the Ordovician succession is a bed of chert conglomerate, four feet thick (specimen 212). This is overlain by quartzite in beds averaging two feet thick, (specimen 213), with some thin layers of shale averaging one inch thick. Wormcasts occur in the sandstone immediately overlying the conglomerate.

Conclusions

The Sumer Group is unmetamorphosed, and near the southern edge of the Sunshine Plain, in particular, (near 3915E 991N) it contains coarse clastics derived from the Precambrian Metamorphics, so that there is a strong probability that it is separated from the Metamorphics by an unconformity.

The Sumer Group is infolded or infaulted with the Metamorphics, the arcuate outcrop from Black Peak around the northern side of Hounslow Heath outlining a large fold which corresponds in position with a large, post-metamorphic, anticline on Mt. Smithies, which refolds the Metamorphics. The Sumer Group thus shares a folding period with the Metamorphics. It is too early to say whether the structure resulting from this folding period is truncated at the base of the Dundas Group, that is, is Precambrian in age, but this is not unlikely.

The occurrence of dykes of the Mt. Remus Swarm intruding basement, is evidence for a quartz-porphyry magma.

Very little prospecting has been done at the cobalt-vanadium lodes of Mt. Remus, the mineralised zone not having been uncovered away from the creek. The deposit warrants further examination.

K. L. Burns
28/3/63

References:

BURNS, K.L. 1961: "Cambrian Rocks of the Dolcoath Anticline" Dept. Min. Tas. Tech. Rep. No. 5 (1960) 34-40

NYE, P.B. 1928: "Molybdenite Prospect at Mt. Remus" Dept. Min. Tas. Unpub. Rep. 6pp, 14/12/28

STILWELL, F.L. 1932: "The Occurrence of Cobalt and Vanadium in Mt. Remus Pyritic Ore" Dep. Min. Tas. Unpub. Rep. 6pp, 5/10/32

Plans

The Mount Remus Traverse - Map 1:Topography & Specimen Locations

" " " " - Map 2:Geology

Co-Ordinates

3872E 8744N 3600 - Co-ordinates on State Grid are 3872E 8744N, altitude is 3,600 feet.